| L Number | Hits | Search Text | DB | Time stamp |
|---|---|---|---|---|
| 1 | 648 | (electrode or lead) near10 (current) near10 (Mr or GMR or tmr) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/05/07 16:51 |
| 5 | 11494 | oxid$4 near10 (cap or ta) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/05/07 16:52 |
| 6 | 472 | (cap or Ta) near10 (MR or gmr or tmr) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/05/07 16:52 |
| 8 | 12 | ((electrode or lead) near10 (current) near10 (Mr or GMR or tmr)) and (oxid$4 near10 (cap or ta)) and ((cap or Ta) near10 (MR or gmr or tmr)) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/05/07 16:52 |

US-PAT-NO: 6274025

DOCUMENT-IDENTIFIER: US 6274025 B1

TITLE: Chemical approach to develop lift-off photoresist structure and passivate MR sensor

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MR heads are manufactured by using a lift-off process to deposit lead layers and define reader track. In this process, a patterned double photo-sensitive layer structure is built on top to the sensor layer. By selectively photo-developing, the edge of the bottom photo-sensitive layer can be dissolved to formed an undercut structure. When stabilization (exchange layer) and **lead layers are physically deposited, the overhang of the top photo-sensitive will block deposition and define the MR** reader edge. Unfortunately, the overspray 30A (of the **lead layers 30) under the photoresist overhang** will cause poor edge definition and product inconsistency. With a decrease in recording track width, the length of overspray (of lead and exchange layers) becomes a fairly large portion of track width and significantly impacts head performance.

The passivation layer 20 is preferably composed of NiCr, Ni(OH).sub.2. Cr.sub.2 O, NiO, NiFeO, or metal hydroxide or metal **oxides, Ta,** Ti or NiFeO; and is most preferably composed of NiFeO. The passivation layer is preferably a product of the passivation/oxidation of the MR sensor. The passivation layer preferably has a thickness of between about 20 and 100 .ANG.(tgt=50 .ANG.).

The invention's passivation layer is (a) an electrical insulator, but (b) a heat conductor. The invention's passivation layer 20 is preferably composed of NiFeO and has a thickness of between about 50 and 150 .ANG.. In contrast, the Prior art's **oxide layer or Ta** layer are too thick to conduct heat away from the MR sensor.

3. The method of claim 1 wherein said passivation layer is composed of a material selected from the group consisting of NiCr, Ni(OH).sub.2, Cr.sub.2 O, NiO, or metal hydroxide, metal **oxides, Ta,** Ti and NiFeO.